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(71) Applicant: MERIT MEDICAL SYSTEMS, INC. [US/US]; 1600 West Merit Parkway, South Jordan, UT 84095 (US).		<div>目的</div> <p>効果的な薬液散布</p> <div>特徴</div> <p>図1 血管に液体を導入するカテーテルにおいて先端部に複数の側孔(注入孔)を有し、数個毎にセツト分けされ、同一セツトの孔はそれぞれ軸方向に規則的に配列される。</p>	
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(74) Agents: NYDEGGER, Rick, D. et al.; Workman, Nydegger & Seeley, 1000 Eagle Gate Tower, 60 East South Temple, South Jordan, UT 84111 (US).			
(54) Title: CATHETER WITH IMPROVED SPRAY PATTERN FOR PHARMACO-MECHANICAL THROMBOLYSIS THERAPY 手配射状に同一角度(θ)の間隔に			
<p>この図は、図1に示すカテーテルの先端部を示す。カテーテルの軸方向に複数の側孔(注入孔)が規則的に配列されている。図1は、カテーテルの先端部を示す。カテーテルの軸方向に複数の側孔(注入孔)が規則的に配列されている。図1は、カテーテルの先端部を示す。カテーテルの軸方向に複数の側孔(注入孔)が規則的に配列されている。</p>			
(57) Abstract			
<p>An improved catheter (28) includes a double spiral configuration of infusion holes (34) around the circumference and along the length (32) of the catheter (28) which provides an improved lateral dispersion of a thrombolytic fluid to more completely and quickly lyse a clot through which the catheter (28) is passing. The double spiral configuration consists of groups or sets of infusion holes (34), typically groups of four. The holes (34) in each set are longitudinally spaced from each other at substantially regular intervals along the length (32) of the catheter (28). Each successive hole in a given group is circumferentially spaced by an angular distance of about 90° around the circumference of the catheter (28) relative to the immediately preceding hole (34). Each group of holes (34) is circumferentially spaced or offset by an angular distance of between 1° and 89° relative to the immediately preceding group of holes (34). Typically, the angular spacing between successive groups of holes is 18°.</p>			

1 A catheter for introducing a liquid into the vascular system comprising:
an elongated tubular body having a single lumen therethrough and an
infusion length near a distal end thereof.

5 a plurality of infusion holes disposed along the infusion length of the
tubular body, said infusion holes being longitudinally spaced along the infusion
length of the tubular body at substantially regular intervals, said infusion holes
belonging to a plurality of successive sets of holes, each successive hole within a
given set being radially spaced apart from each immediately preceding hole within
10 the given set by an angular distance of about θ , each set of holes having a first
hole and a last hole, each successive set of holes being circumferentially offset
from an immediately preceding set by an angular distance δ such that the first hole
of an immediately succeeding set is circumferentially offset from the last hole of
an immediately preceding set by an angle other than a multiple of θ .

15 ~~2.~~ A catheter as defined in claim 1, wherein $\theta = 360^\circ/n$, wherein n is an
integer greater than 1.

~~3.~~ A catheter as defined in claim 2, wherein n is equivalent to the number of
holes within each set of holes.

~~4.~~ A catheter as defined in claim 3, wherein $n = 4$ such that $\theta = 90^\circ$ and each
set of holes includes 4 infusion holes.

20 ~~5.~~ A catheter as defined in claim 1, wherein δ is an angle in a range selected
from the group consisting of 1-89°, 91-179°, 181-269° and 271-359°.

~~6.~~ A catheter as defined in claim 5, wherein δ divides evenly into 360°.

~~7.~~ A catheter as defined in claim 5, wherein δ divides evenly into 90°.

~~8.~~ A catheter as defined in claim 5, wherein δ equals 18°.

25 ~~9.~~ A catheter as defined in claim 1, wherein the infusion holes are
longitudinally spaced at regular intervals of about 0.05 inch.

~~10.~~ A catheter as defined in claim 1, wherein the infusion holes have a diameter
in a range from about 0.002 inch to about 0.006 inch.

30 ~~11.~~ A catheter as defined in claim 1, wherein the infusion holes have a size
gradient such that in an infusion length having a first hole and a last hole the last hole has
a diameter greater than the diameter of the first hole.

~~12.~~ A catheter as defined in claim 1, wherein the infusion length includes from between about 40 to about 240 holes.

~~13.~~ A catheter for introducing a liquid into the vascular system comprising:
an elongated tubular body having a single lumen therethrough and an
infusion length near a distal end thereof.

a plurality of infusion holes disposed along the infusion length of the tubular body, said infusion holes being longitudinally spaced along the infusion length of the tubular body at substantially regular intervals, said infusion holes belonging to a plurality of successive sets of n holes, each successive hole within a given set of holes being radially spaced apart from each immediately preceding hole within the given set by an angular distance of about $360^\circ/n$, each set of holes having a first hole and an n th hole, each successive set of holes being circumferentially offset from an immediately preceding set by an angular distance of about x° such that the first hole of an immediately succeeding set is circumferentially offset from the n th hole of an immediately preceding set by an angle of about $360^\circ/n + x^\circ$.

~~14.~~ A catheter as defined in claim 13, wherein n equals an integer greater than

1.

~~15.~~ A catheter as defined in claim 13, wherein $n = 4$ and $x = 18$.

~~16.~~ A catheter as defined in claim 13, wherein $n = 5$ and $x = 15$.

~~17.~~ A catheter for introducing a liquid into the vascular system comprising:
an elongated tubular body having a single lumen therethrough and an
infusion length near a distal end thereof.

a plurality of infusion holes disposed along the infusion length of the tubular body, said infusion holes being longitudinally spaced along the infusion length of the tubular body at substantially regular intervals, said infusion holes belonging to a plurality of successive sets of four holes such that each successive hole within a given set is radially spaced apart from each immediately preceding hole within the given set by an angular distance of about 90° , each set of holes having a first hole and a fourth hole, each successive set of holes being circumferentially offset from an immediately preceding set by an angular distance

of x° such that the first hole of an immediately succeeding set is circumferentially offset from the fourth hole of an immediately preceding set by an angle of about $90^\circ + x^\circ$, wherein x° divides evenly into 90° .

- 5 ~~18.~~ A catheter as defined in claim 17, wherein x° is equal to 18° .
- ~~19.~~ A catheter as defined in claim 17, wherein the infusion holes are longitudinally spaced at regular intervals of about 0.05 inch.
- ~~20.~~ A catheter as defined in claim 17, wherein the infusion holes have a diameter in a range from about 0.002 inch to about 0.006 inch.

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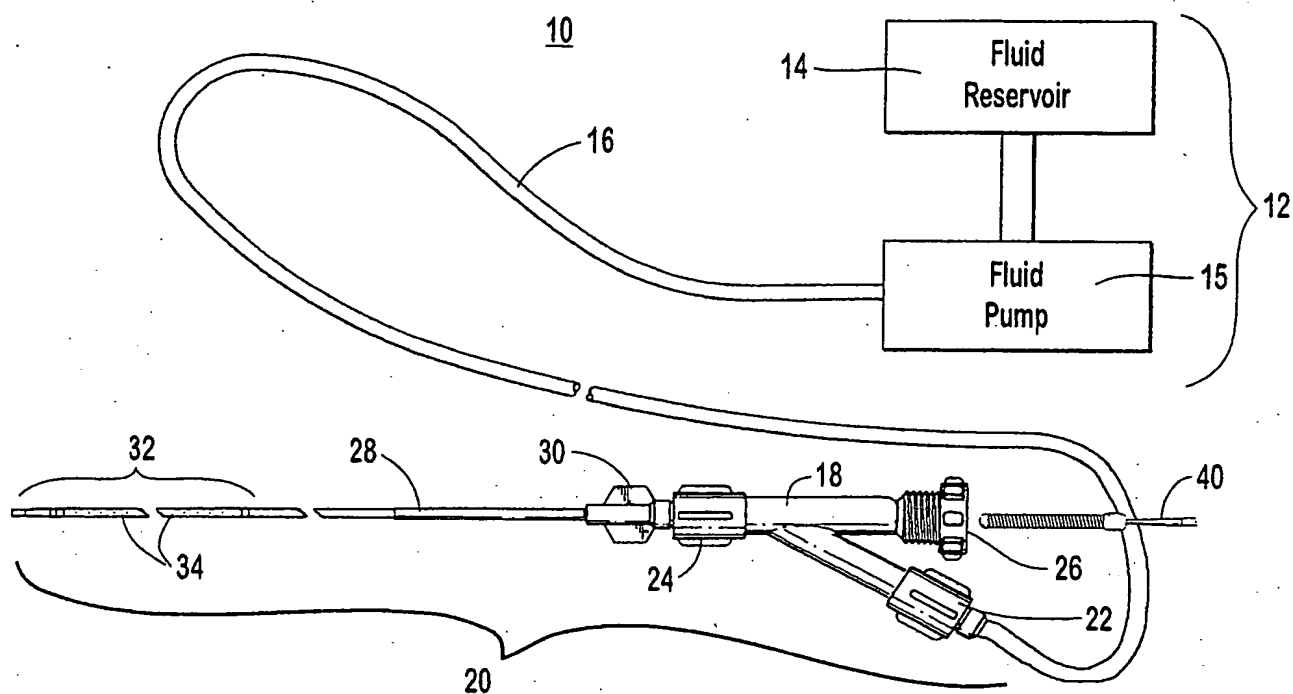


Fig. 1

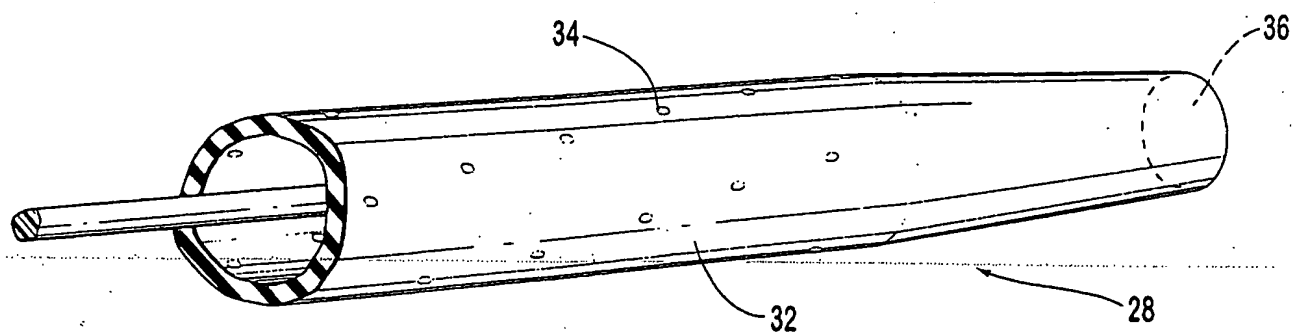


Fig. 2

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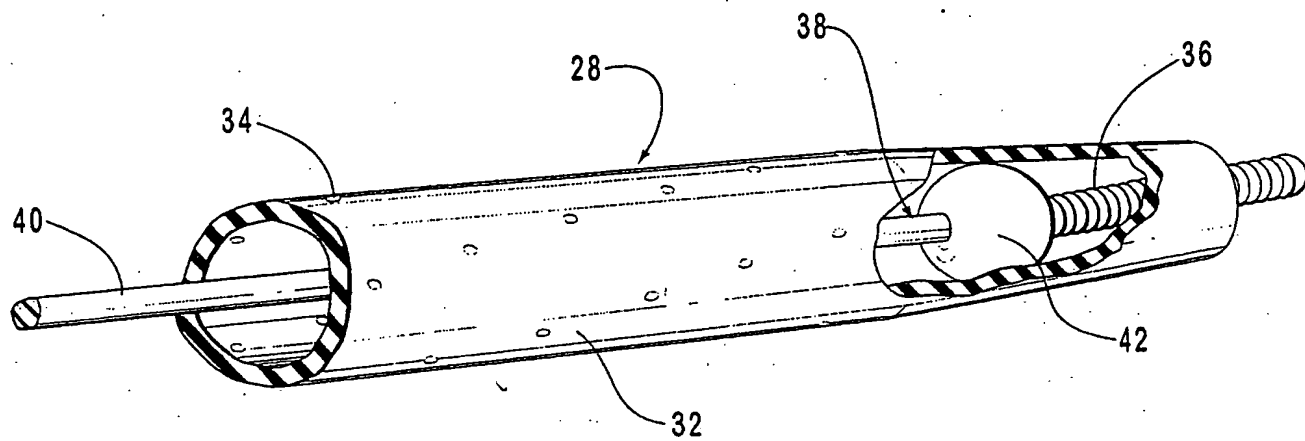


Fig. 3

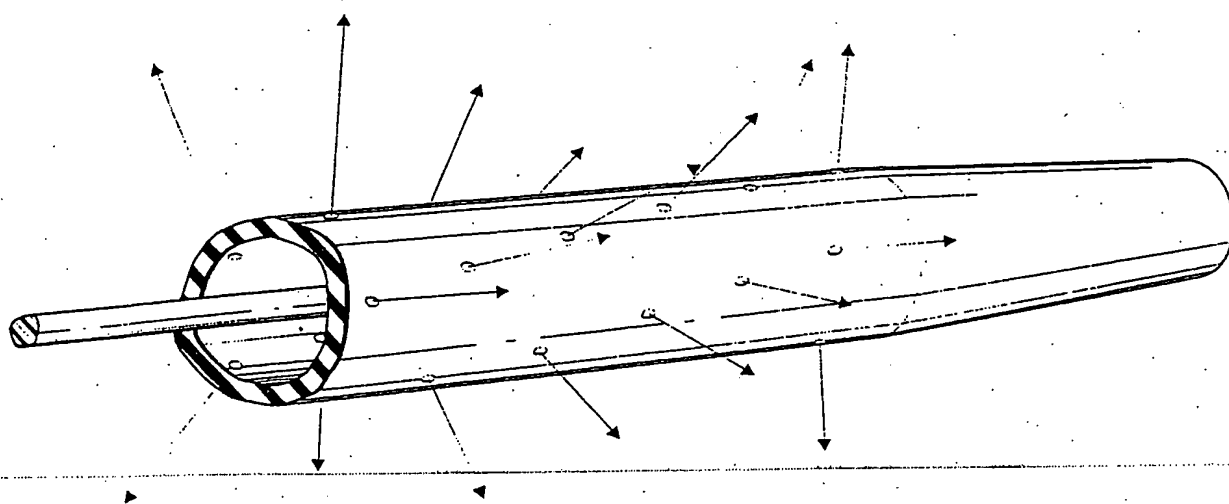


Fig. 4

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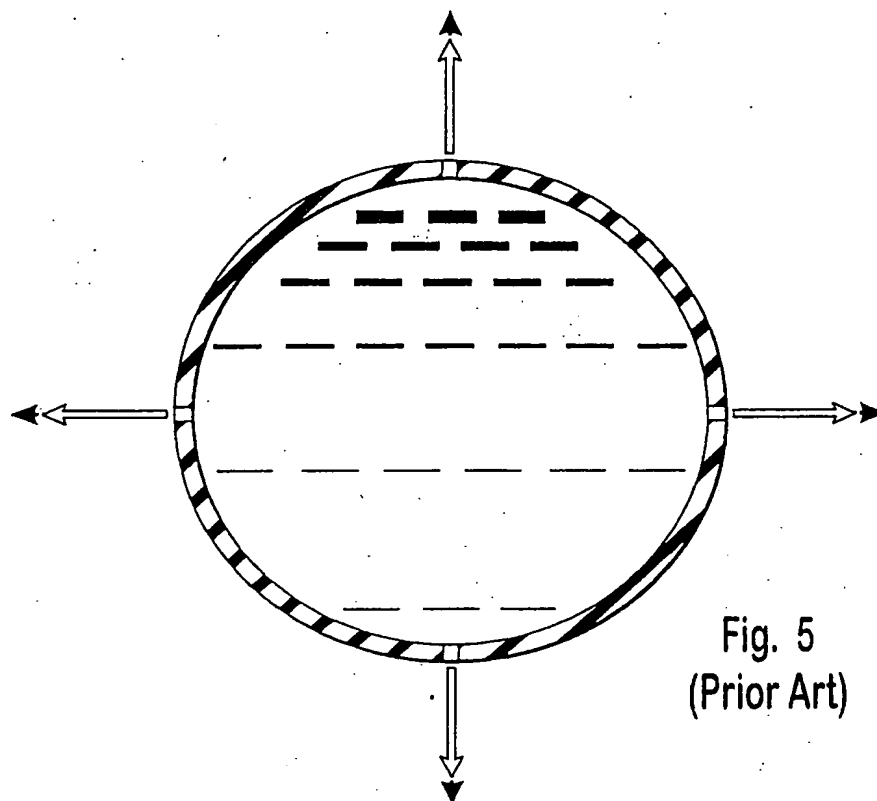


Fig. 5
(Prior Art)

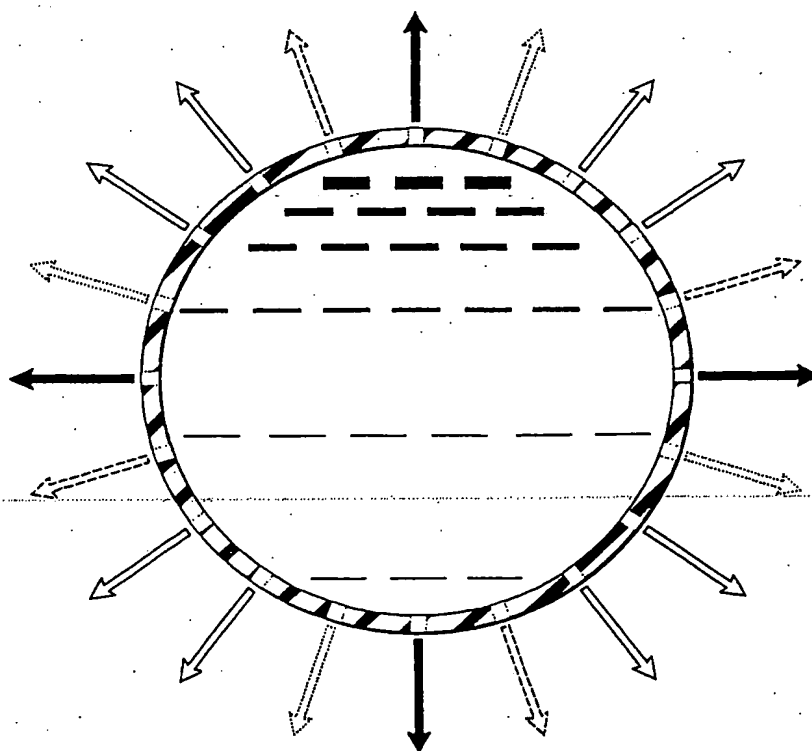


Fig. 6

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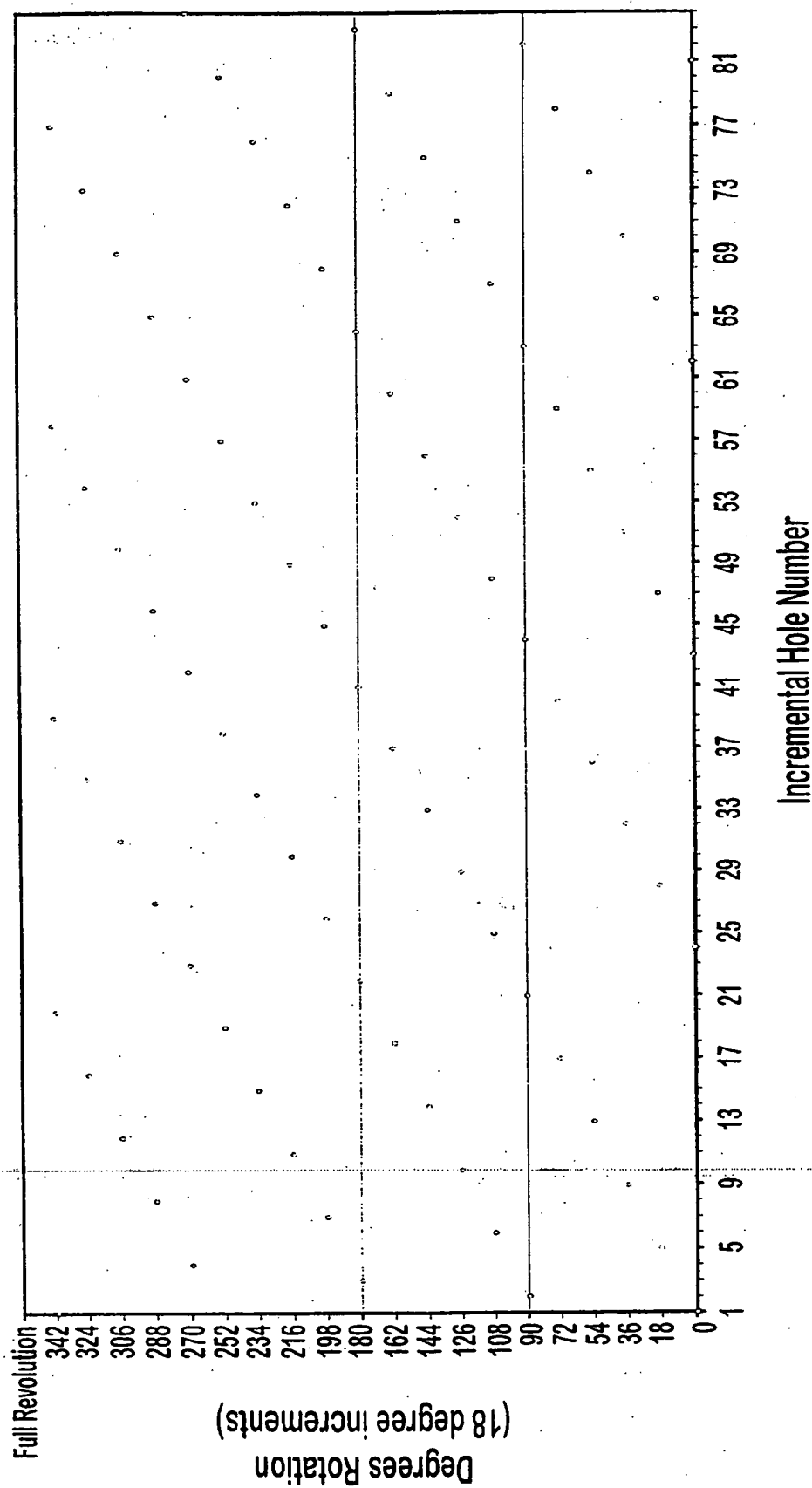


Fig. 7

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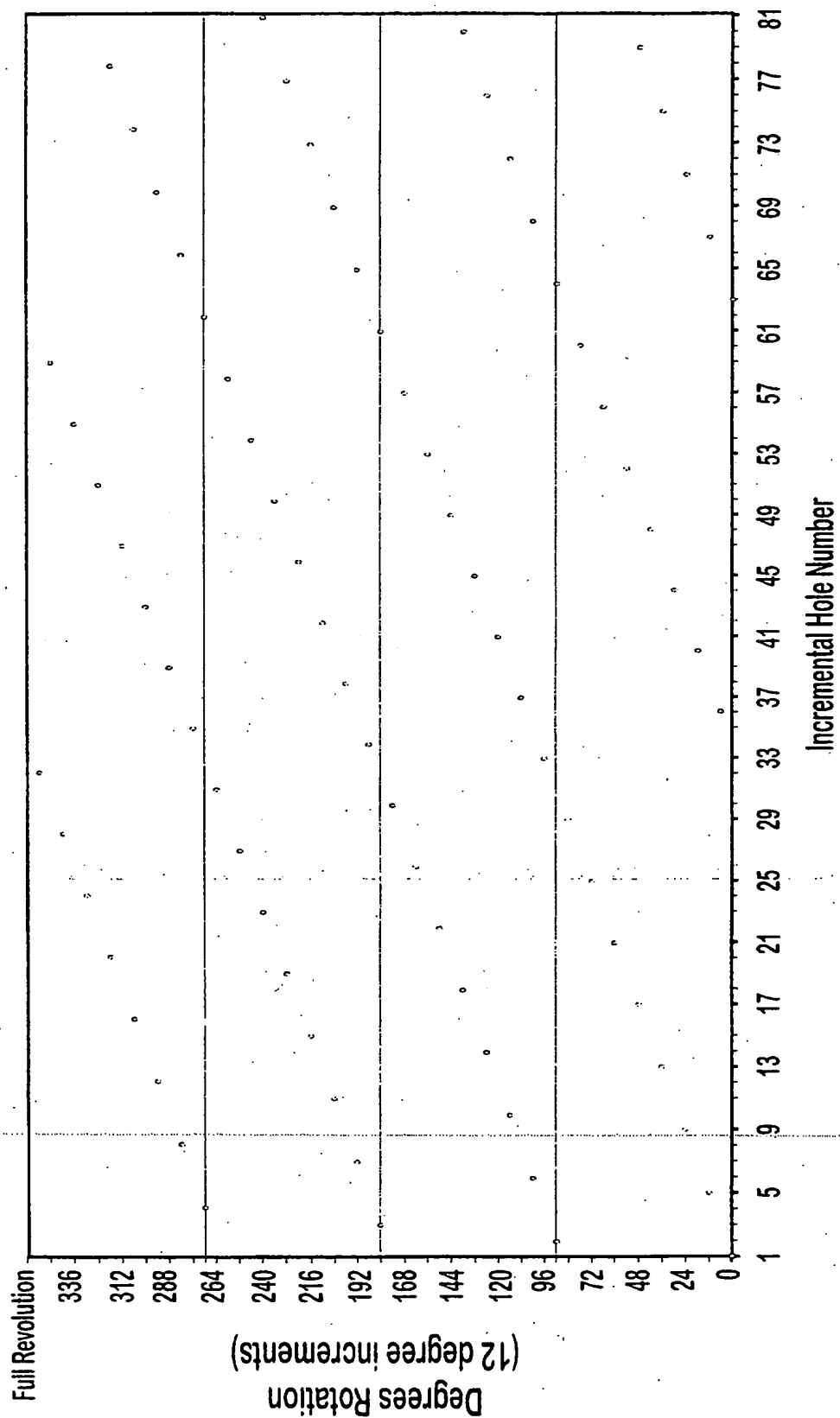


Fig. 8